

determined air-fuel ratio (see col. 10 lines 5-7 and col. 11, lines 1-5). Atago et al. then determines a swirl number (see col. 11, lines 5-12) and determines the intake valve opening timing, the valve opening time (or the predetermined crank angle), and the valve opening lift of the intake valve (see col. 10, lines 8-21 and col. 11, lines 13-24). As described at col. 10, lines 48-51 and col. 11, lines 29-39, Atago et al. then corrects the basic fuel injection "according to the determined valve opening timing, the valve opening time and the maximum valve lifting amount." In particular, Atago et al. calculates "a correction coefficient based on the valve opening timing, the valve opening time (or the predetermined crank angle) and the valve opening lift of the intake valve." Atago et al. indicates that the "correction coefficient is a special correction item given in consideration of the influence on the combustion stability of the engine in association with the operation of the intake valve." See col. 11, lines 34-38. As described at col. 7, line 56 - col. 8, line 2, "combustion stability" as used in Atago et al. relates to the effect of changes in the engine load for a given air-fuel ratio.

With respect to all independent claims pending in this application (claims 19, 23, 35, 41, 43 and 46), Atago et al. does not disclose or suggest taking any corrective actions "to reduce the variation in the air-fuel ratio among the plurality of cylinders." Atago et al. does not discuss variation in air-fuel ratio among the plurality of cylinders. While Atago et al. discusses a "target A/F difference of each cylinder" (see, for example, col. 10, line 7), this target A/F difference of each cylinder pertains to "a difference between the regular A/F of the cylinder and the special target A/F for a cold start ... of each cylinder." See, for example, col. 9, lines 52-62 of Atago et al. The target A/F difference does not relate to differences in air fuel ratio among the plurality of cylinders.

Accordingly, Atago et al. does not disclose or suggest "a controller that detects a variation in an air-fuel ratio among the plurality of cylinders" and that "corrects a fuel injection quantity on the basis of the detected variation in the air-fuel ratio and an operation

angle of an intake valve of each of the cylinders so as to reduce the variation in the air-fuel ratio when the variation is detected" as recited in independent claim 19, or the similar method steps recited in independent claim 35. Atago et al. does not disclose or suggest that its correction coefficient, which may be calculated based on the predetermined crank angle, reduces variation in the air-fuel ratio among the plurality of cylinders. For similar reasons, Atago et al. does not disclose or suggest the claim 23 "controller that reduces a variation in an air-fuel ratio among the plurality of cylinders by correcting a fuel injection quantity," the similar method of independent claim 41, the claim 43 "controller that reduces a variation among the plurality of cylinders on the basis of an operation angle of an intake valve of each of the cylinders," or the similar method of independent claim 46.

Independent claims 23, 41, 43 and 46 are patentable over Atago et al. for the additional reasons that Atago et al. does not disclose or suggest the specific steps recited in these claims, which result in "updating a fuel injection quantity correction coefficient" (claims 23 and 41) or "updating a correction coefficient" (claims 43 and 46) based on a calculated relationship between the operation angle of the intake valve and the "calculated fuel injection quantity correction coefficient" (claims 23 and 41) or the "calculated correction coefficient" (claims 43 and 46). The relationships recited in claims 23, 41, 43 and 46 are not calculated, and thus are not used, in Atago et al. Dependent claims 49 and 50 are further patentable over Atago et al. for this reason as well.

Furthermore, Atago et al. does not disclose or suggest that the amount of correction for reducing the variation is increased as the operation angle of the intake valve is decreased, as recited in dependent claims 22, 24, 40, 42, 45 and 48. These claims thus are patentable over Atago et al. for this additional reason.

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

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